UNIT 6 SYNTAX OF SCOPE: ADVERBS, QUANTIFIERS AND NEGATION

Structure

6.0 OBJECTIVES

The objectives of this unit are that at the end of this unit you should be able to

- have a basic understanding of the notion of syntactic scope,
- see the need for a distinct syntactic level called "Logical Form" or "LF",
- see how adverbs fit into phrase structure,
- understand the notion of quantification, and identify salient quantifiers in English,
- have a basic understanding of the syntax and semantics of negation,
- understand how adverbs, quantifiers, and negation interact in scope at LF.

6.1 INTRODUCTION

6.1.1 What is "scope" in syntax?

Thus far, we have examined matters of structure and reference in syntax, without regard to the possible ambiguities that may arise out of the interaction of *meanings* of syntactic elements. In this unit, we look at an area of syntax and semantics that involves precisely this kind of interaction of meanings -- the phenomenon of **scope** in the interpretation of sentences containing certain kinds of expressions in English. To see what scope is, let us consider a simple sentence of English:

The general idea is that the S-structure of a sentence, derived from its D-structure through the operation largely of movement transformations, undergoes interpretation into two further levels -- the level of embodiment of the sentence into its actually pronounced version, i.e., PF, and the level of semantic interpretation of the sentence, i.e., LF. The interpretation of scope was found to be feasible, not at D-structure or any other level, but at LF.

6.1.3 Scope-bearing elements in English

English has several different classes of scope-bearing elements: adverbs, quantifiers, focusing words such as *only* and *even*, and negative words such as *no* and *not*, are all expressions that can have wider or narrower scope over clauses and sentences. The differences in scope of scope-bearing elements within the same sentence become especially clear when one considers the relative scope of one element as compared to that of another. We have seen this in the case of the quantifier expressions *everyone* and *two (languages)*.

6.2 ADVERBS

6.2.1 The traditional definition of an adverb

Traditionally, an adverb has been defined as "a word that modifies a verb, an adjective, or another adverb". Therefore, a rather diverse range of words are included in the class of adverbs. Examples are the underlined words in the following sentences:

(5)
a. Harish runs fast.
b. Sita speaks Andamanese fluently.
c. Fortunately, the victim decided not to press charges.
d. The cyclone completely destroyed several villages.
e. John nevertheless continued fighting.
f. Ram was very hungry.
g. The cyclone almost completely destroyed those villages.
h. He speaks extremely slowly.

The problem is that this has meant the lumping together of different classes of words into a single class called "adverbs", even though some of them -- such as *very* in (f), *almost* in (g), and *extremely* in (h) -- are actually **degree modifiers** rather than adverbs proper. Accordingly, the traditional definition needs to be narrowed down further, and certain words have to be excluded from the class of adverbs so that we get a relatively homogeneous class. Note also that the traditional morphological definition of an adverb as a word ending with *-ly* is both too broad, since it includes adjectives such as *deadly* and *friendly* (and degree modifiers such as *extremely*), and too narrow, since it excludes adverbs such as *fast*, *always*, and *often*. **We thus adopt the position that an adverb is a word that modifies a verb, or a verb phrase, or a sentence.**

6.2.2 The classification of adverbs

McCawley (1988) classifies adverbs into three kinds: **V-modifying, V'-modifying** or VP-modifying, and **S-modifying** or IP-modifying adverbs. An adverb is a V-modifying adverb if it modifies a verb alone, as in the sentences (5a) and (5d). Note that *fast* in (5a) modifies the verb *runs*, and *completely* in (5d) gives greater focus to the meaning of the verb *destroyed* (rather than modifying the entire verb phrase *destroyed several villages*). On the other hand, consider the following examples:

(1) Everyone in this room knows two languages.

This is straightforward enough as a sentence. Yet when we think a little more about how to interpret it, we realize that it can be interpreted in two different ways. Supposing there are four individuals, W, X, Y, and Z sitting in a room. There is a set of languages, say Assamese, Bhotia, Chattisgarhi, Dutch, and English, that are spoken in areas that W, X, Y, and Z come from. Then the sentence (1) can mean either of two things, something like (2a) or something like (2b):

(2) a. W knows Chattisgarhi and English, X knows Assamese and Dutch, Y knows Bhotia and Chattisgarhi, and Z knows Bhotia and Dutch.

b. W, X, Y, and Z all know Bhotia and English.

These two interpretations of the sentence (1) can be expressed in more general terms as follows:

(3) a. For every person *x* in this room, there are two languages *y* and *z*, such that *x* knows *y*, *z*.

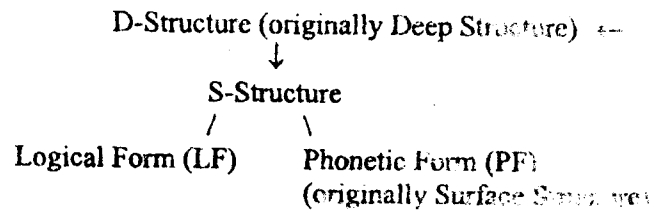
b. There are two languages *a* and *b* such that, for every person *x* in this room, *x* knows *a* and *b*.

These two interpretations of (1) arise out of the difference in the relative domains of applicability of the two expressions *everyone* and *two languages*: for the reading (3a), we say that *everyone* has wider (or higher) **scope** than *two languages*, whereas we say that for the reading (3b), *two languages* has wider (or higher) scope than *everyone*. Note that, by itself, *everyone* (i.e., all the people in this room) is quite unambiguous in its meaning, and similarly, we find the meaning of *two languages* all by itself quite straightforward.

6.1.2 The notion of "Logical Form" or "LF"

Generative grammar has undergone many revisions and extensions since its original version -- transformational generative grammar -- was put forward by Noam Chomsky in his 1957 book *Syntactic Structures*. Chomsky gave fuller shape to his theory of transformational grammar in his 1965 book *Aspects of the Theory of Syntax*; this theory came to be known as the Standard Theory of transformational grammar. During the late 1960s and early 1970s, however, Chomsky and a number of other generative grammarians proposed certain further revisions and extensions, some of which had to do with the role of meaning in generative grammar. Matters such as differences in scope demanded an adequately explanatory account within the framework of generative grammar, and as a result the idea of a separate level of semantic interpretation -- i.e., interpretation of meaning -- besides the levels of deep and surface structure gained further ground within the theory of generative grammar. This led to the postulation of a level of meaning-interpretation that was originally named **Logical Form** and subsequently came to be called simply **LF**, over and above deep structure and surface structure. The different levels of representation for sentences in a language came to be structured as follows, in what came to be known as the Revised Extended Standard Theory or the **Theory of Government and Binding**, later called the **Principles-and-Parameters Theory**:

(4)



(6) a. The boss reluctantly granted me medical leave.
b. Sita intentionally left the money out on the table.

In these sentences, the adverbs *reluctantly* and *intentionally* are V'-modifying or VP-modifying adverbs, since they qualify the entire verb phrase rather than the verb alone: thus, *reluctantly* expresses the boss's manner of giving me medical leave, and *intentionally* qualifies the act of leaving money out on the table. Examples of S-modifying adverbs can be seen in the following examples:

(7) a. Fortunately, Ram has enough savings to meet the expenses.
b. Most probably I shall be seeing Sita next Sunday.

The adverb *fortunately* describes the entire fact of Ram's having enough savings to meet the expenses, and is therefore an S-modifying or IP-modifying adverb. Likewise, the adverb *probably* adds the meaning of great likelihood to the possibility of my seeing Sita next Sunday, as a whole, and is therefore an S-modifying or IP-modifying adverb.

This three-way classification of adverbs is (as yet) not widely known, however, and certain confusions can arise especially as to whether an adverb is a V-modifying or VP-modifying adverb. A more commonly known system of classification of adverbs is the three-way classification into:

(i) **adverbs of time,**
(ii) **adverbs of place,**
(iii) **adverbs of manner.**

An **adverb of time** is an adverb or adverbial phrase that carries information about the time or time-scale of an event. Examples are the following:

(8) a. I shall meet you soon at the Main Crossing.
b. He finally came an hour later.
c. Ram leaves for work at 8:00 a.m.

In the sentence (8a), the adverb *soon* gives the hearer an approximate idea of the time-span within which the speaker can be expected to meet the addressee at the Main Crossing; in (8b), the adverbial phrase *an hour later* gives us the span of time that had passed when he finally came; and in (8c), the adverbial phrase *at 8:00 a.m.* -- which is structurally a prepositional phrase, headed by the preposition *at*, conveys the accurate time at which Ram leaves for work. An adverb of time can also be a bare noun or noun phrase, as in the following examples:

(9) a. See you tomorrow. (*Compare:* Tomorrow is another day.)
b. I leave for Kathmandu next Friday. (*Compare:* Next Friday will be a holiday.)

An **adverb of place** is an adverb that conveys the location at which an event has taken place, is taking place, or is expected to take place. Adverbs of place occur in the following examples:

(10) a. Come here.
b. I shall meet you soon at the Main Crossing.
c. He put the box down ten yards away.

The (deictic -- see Unit 5) word *here* is an adverb of place, signalling the immediate vicinity of the speaker; the prepositional phrase *at the Main Crossing* is also an adverb of place, signalling the location at which the speaker will meet the addressee; and the adverbial phrase *ten yards away* is an adverb of place indicating the distance from some understood location at which he put the box down.

The general idea is that the S-structure of a sentence, derived from its D-structure through the operation largely of movement transformations, undergoes interpretation into two further levels -- the level of embodiment of the sentence into its actually pronounced version, i.e., PF, and the level of semantic interpretation of the sentence, i.e., LF. The interpretation of scope was found to be feasible, not at D-structure or any other level, but at LF.

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An **adverb of manner** conveys information on the manner in which an action or event takes place. Adverbs of manner occur in examples such as the following:

(11) a. He runs fast.
b. She speaks slowly.
c. The performers danced very beautifully.
d. All of a sudden, Ram stopped walking.

The underlined words and phrases in these four sentences are adverbs of manner, since they convey the manner in which the actions of running, speaking, and dancing, and the event of Ram's ceasing to walk, take place.

6.2.3 The scope of adverbs

Certain adverbs exhibit scope phenomena. Take the following sentence:

(12) This teacher always has five students in his class on Mondays.

This sentence is ambiguous, since it can be interpreted to mean either (13a) or (13b):

(13) a. It is always the case that this teacher has exactly five students, no more or less, in his class on Mondays.
b. There are five students, A, B, C, D, and E, who are always to be found in this teacher's class on Mondays.

Under the interpretation (13a), the adverb *always* has wider scope over the quantified NP *five students*, so that no SPECIFIC five students are being mentioned here; whereas, under the interpretation (13b), the adverb *always* has narrower scope, with *five students* having wider scope over it, so that five specific students (A, B, C, D, E) are being referred to.

6.3 QUANTIFIERS

6.3.1 What is a "quantifier"?

You will have encountered the term **quantifier** several times by now, without perhaps fully knowing what it stands for. Although quantifiers do not constitute one of the traditional parts of speech (unlike nouns, pronouns, verbs, and adverbs), they form an important class of expressions -- they are expressions that indicate quantities (hence the term "quantifier"). Thus, the numerals *one*, *two*, *twenty*, etc., form a special class of quantifier expressions; and so-called "quantitative adjectives" such as *all*, *some*, *many*, *any*, *each*, etc., also belong to the class of quantifiers. Also included in the class of quantifiers are so-called "indefinite pronouns" such as *someone*, *something*, *everybody*, *anything*, since these also convey something about the number or proportion of persons and objects. Thus, quantifiers include expressions belonging to more than one of the traditionally defined parts of speech. (McCawley (1988), however, holds that every lexical noun phrase in English is implicitly or explicitly a quantifier expression, since it usually also conveys something about the number, proportion, or quantity of individuals or material.)

6.3.2 The scope of quantifiers

We have, in a sense, already seen in Subsection 6.1.1 how two quantifier expressions can interact with each other in scope. A further example is the following ambiguous sentence:

(6) a. The boss reluctantly granted me medical leave.
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In these sentences, the adverbs *reluctantly* and *intentionally* are V'-modifying or VP-modifying adverbs, since they qualify the entire verb phrase rather than the verb alone: thus, *reluctantly* expresses the boss's manner of giving me medical leave, and *intentionally* qualifies the act of leaving money out on the table. Examples of S-modifying adverbs can be seen in the following examples:

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6.3.2 The scope of quantifiers

We have, in a sense, already seen in Subsection 6.1.1 how two quantifier expressions can interact with each other in scope. A further example is the following ambiguous sentence:

(14) Someone loves everyone.

This sentence can be interpreted in either of two ways, as follows:

(15) a. There is some person *x* such that, for every person *y*, *x* loves *y*.
b. For every (individual) person *y*, there is some person *x* such that *x* loves *y*.

The two readings differ in that, in the reading (15a), the indefinite pronoun *someone* has wider scope over the indefinite pronoun *everyone*; whereas in the reading (15b), *everyone* has wider scope over *someone*. Of course, the real-life situation in which this kind of sentence is uttered usually allows us to choose only one out of the two readings. Both the readings are made available, however, as LF representations of the sentence.

6.3.3 The special quantifiers *only* and *even*

We now come to two very commonly used words in English which behave like quantifiers in certain ways, but have traditionally been described as adverbs, although they actually belong to a class in themselves. These are the words *only* and *even*. These words have also been called **focus-linked elements**, because they usually serve to focus on, or "highlight", a particular word or phrase in a sentence in which either of them might occur. In spoken language, the focused word or phrase may additionally carry special emphasis or stress. Thus, consider the following sentences:

(16) a. Only *Ram* knows how to swim.
b. I only wanted to *help* you!
c. Man does not live only by *bread*.
(17) a. Even *a child* can lift this box. (... let alone a weight-lifter.)
b. I don't even want to *talk* to her. (... let alone invite her to tea!)
c. He could not have imagined it even in his *dreams*. (... let alone in real life.)

In each of these sentences, the word or phrase in italics is the element focused on by the word *only* or *even*. Note that *only* or *even* functions like an adverb only in some of these sentences; in the others, it behaves like an adjective.

The words *only* and *even* are also like quantifiers, however, in that they exhibit scope phenomena, especially in relation to negation. This can be seen from the way in which the same sentence can be extended in two ways, as follows:

(18) a. You can **not** only *read* these books (, you can *borrow* them as well).
b. You can**not** only *read* these books (, you have to *summarize* them as well).

In the reading (18a), the word *only* seems to have wider scope than the negation *not*, since the extension tells us what you *can* do in addition. In the reading (18b), however, the negation *not* seems to have wider scope over *only*, since the extension tells us what you are not allowed to do all by itself. (This is reflected also in the closer relationship of the negation *not* with the modal *can* in the reading (18b) than in the reading (18a).)

In the case of *even*, however, a difference in scope seems to co-occur with a difference in the order of *even* and a scope-bearing element such as *not*. Thus, consider the following examples:

(19) a. Mary has not even begun the *lecture* yet (, let alone answering questions).
b. Mary has even *not* begun the lecture yet (, she is so keen for Sita to arrive first).

The interaction in scope between *only* or *even* and other scope-bearing elements such as adverbs, other quantifiers, and negation, is a lively area of ongoing research in syntax, and therefore still awaits a fuller understanding.

6.4 NEGATION

6.4.1 Negation as a logical operator

Negation in English is a fascinating area of syntactic study, precisely because it plays a central role in affecting both the structure and the total meaning of a sentence at the same time. The term **negation** is used to cover words such as the utterance *no*, *not* and the contraction *-n't*, the negative indefinite pronouns *nothing*, *nobody*, the adjective *no* (as in *no one* or *no money*), the adverbs *nowhere*, *never*, and the conjunctions *neither ... nor*. Note that, when a true sentence is negated, it becomes a false sentence; and, conversely, when a false sentence is negated, it becomes true. For this reason, at the level of meaning (and at LF), negation is taken to be a logical operator that can affect the truth-value (i.e., truth or falsity) of the meaning of a sentence. Thus, if we accept the sentence

(20) Snow is white.

as being true, then we have to accept the sentence

(21) Snow is not white.

as being a false sentence; and, conversely, if we accept the sentence

(22) The moon is made of green cheese.

as being false, then we have to accept the sentence

(23) The moon is not made of green cheese.

as being true. However, negation is also of interest because it can sometimes create a paradox, as in the case of the following sentence:

(24) This sentence is not true.

If we take this sentence to be true, then in effect we have to accept that it is *not* true; but if we take it to be false, then in effect we are agreeing with the claim made by the sentence that it is not true, and therefore accepting that the sentence is true. (Sentences of this kind are said to be illustrations of *Russell's Paradox*, named after the famous British mathematician, philosopher, and author Bertrand Russell.)

Negation, like other logical operators, is also a scope-bearing element: we have seen an example of this already in Subsection 6.3.3. We shall see a further example of this in Subsection 6.4.3.

6.4.2 Two kinds of negation in English

Thus far, we have assumed that all negative expressions in English can be lumped together under the cover term "negation". However, English also has morphological prefixes such as *un-*, *in-/im-*, and *dis-* to express the opposites of the meanings of certain individual words: in such a situation, strictly speaking, it is not the sentential meaning as a whole that has been negated but the rather the meaning of the individual word that has been inverted. This in contrast to the behaviour of negative words like *no* and *not* earlier. Notice the differences in meaning between the members of the following sentential pairs:

(25) a. John is not very happy with the situation.
b. John is very unhappy with the situation.
(26) a. Sita expressed no pleasure at the prospect.
b. Sita expresseed displeasure at the prospect.

To say that John is not very happy with the situation is to make a milder statement than to say that John is very unhappy with the situation; and Sita's not expressing any pleasure at the prospect is not exactly the same thing as Sita's actually giving expression to her displeasure at the prospect. Thus, morphological negation and syntactic negation do not have the same semantics. Furthermore, it seems to make sense to look for scope phenomena only in the case of *syntactic* negation, and not morphological negation, since it is syntactic negation that has the effect of negating the meaning of the affirmative sentence as a whole.

6.4.3 The scope of negation

As promised earlier, we shall look further at how negation can interact with scope with other scope-bearing elements such as quantifiers. Consider the contrast between the following sentences, imagining the situation to be one after an amateurs' archery meet:

(27) a. Many arrows didn't hit the target.
b. Not many arrows hit the target.

The sentence (27a) is ambiguous between the two readings (28a) and (28b) below, while the unambiguous sentence (27b) has only the reading (28b), not (28a):

(28) a. For many arrows A, it was not the case that A hit the target.
b. It was not the case that, for many arrows A, A hit the target.

On the reading (28a), the quantifier *many* has wider scope than the negation *not* whereas on the reading (28b), *not* has wider scope than *many*. Note that the sentence (27a) can be extended in the following way, whereas the sentence (27b) cannot be so extended without a resulting contradition:

(29) a. Many arrows didn't hit the target (, but many *did* hit the target).
b. Not many arrows hit the target(, *but many *did* hit the target).

Furthermore, there is a class of words and phrases that occur only within the scope of negation, called **negative polarity items**. Consider the contrast among the following sets of sentences:

(30) a. Sita knows something.
b. Sita doesn't know anything.
c. ? Sita knows anything.

(31) a. I like spinach very much.
b. I don't like spinach at all.
c. *I like spinach at all.

(32) a. Mr X drinks a lot.
b. Mr. X doesn't drink much.
c. *Mr X drinks much.

Note that, in the sentence (30b), the word *anything* replaces *something* when the negative element *-n't* occurs with the verb -- thus, it does not have the same meaning in (30b) as in (30c), which is not very natural in English (unless spoken with expressive stress on *anything* -- "Talk about *anything* and Sita knows it already"). This is because *anything* in (30b) is a negative polarity item, the counterpart of *something* in the affirmative sentence (30a). In the set of sentences (31a-c), we find that the phrase *at all* can only occur with the negative element as in (31b). In the set of sentences (32a-c), we notice that *much* occurs as the negative polarity counterpart of *a lot*, and that it cannot occur in a simple affirmative sentence like (32c). Thus, negation exerts an influence on the distribution of items within its scope, and especially selects negative polarity items.

6.5 CONCLUSION

In this unit, we have seen how adverbs, quantifiers, and negation are all scope-bearing elements in English. We have also seen that these elements can interact with one another in scope across their respective classes: thus, for example, negation can interact in scope with a quantifier, and a quantifier can interact in scope with an adverb. Scope-bearing elements are of syntactic interest especially because they are *by themselves* fairly innocent, unambiguous words, and give rise to ambiguity only when they occur in syntactic combinations with one another in full-fledged sentences. Scope is a major reason why a separate level of representation such as LF has had to be posited in the generative grammar of English. Scope as well as scope-bearing elements continue to be investigated actively by scholars working on matters of language, since they offer interesting insights into how linguistic meanings can be understood for sentences, whether in isolation or in pieces of discourse such as literary texts.

6.6 LET US SUM UP

1. In the model of generative grammar adopted in Government-Binding Theory, D-structure is connected to S-structure through transformations such as Wh-Movement and NP-Movement, and S-structure branches out into two interpretative levels, the level of Surface Structure or "phonetic form" (PF), and the level of "logical form" or LF.
2. Ambiguity arising out of differences in the relative scope of two expressions in a sentence is resolved at the LF level.
3. Adverbs, quantifiers, and negation are all scope-bearing elements in English.
4. Adverbs can be classified into V-modifying, VP-modifying, and IP-modifying adverbs.
5. Alternatively, adverbs can be classified into adverbs of time, adverbs of place, and adverbs of manner.
6. The class of quantifier expressions includes "indefinite pronouns" such as *something, anyone, everybody*; (cardinal) numerals; and quantitative adjectives such as *all, each, some, many*, and *most*.
7. Negation is both a logical operator and a syntactically significant scope-bearing element.
8. Adverbs, quantifiers, and negation can often display interactions of scope with one another if they occur within the same sentence.

6.7 KEY WORDS

adverb: A word or phrase (or clause) that can modify a verb, or a verb phrase, or even a clause.

Logical Form or LF: The level of interpretation of certain kinds of sentence-meaning that can be "read off" from the level of S-structure representation of a sentence. Matters of scope are made explicit at the LF level for a sentence containing scope-bearing elements such as adverbs, quantifiers, and negation.

negation: In logic, a one-place operator that converts a true proposition into a false one and a false proposition into a true one. In English syntax, any one of the elements *no*, *not*, *-n't*, *never*, *neither ... nor*, *nowhere*.

quantifier (expression): An indefinite pronoun, numeral, quantitative adjective (or adverb, e.g., *somewhere*, *everywhere*) that denotes a particular absolute quantity or relative proportion; quantifiers are scope-bearing elements.

scope: A semantic property specifying the domain of interpretation of an expression such as an adverb or a quantifier, often relative to another such expression; scope is resolved at the level of LF.

6.8 BIBLIOGRAPHY

On the level of LF and the interpretation of scope at LF: Horrocks 1987, pp. 95-97; McCawley 1988, pp. 549-552, 595-630; Verma & Krishnaswamy 1989, pp. 172-173 (especially p. 173).

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6.9 QUESTIONS & EXERCISES

1. Construct five example sentences of your own that display ambiguities of scope, and explain the alternative interpretations for each, stating which elements interact in scope

2. Consider the following pair of sentences. Are they identical in meaning? If not, can you say why?

   (a) Every American wants to be rich.
   (b) Every American wants every American to be rich.

3. Consider the following sentence. Is it ambiguous in your opinion? If so, state the different readings of the sentence. Either way, state why you do or do not find it ambiguous.

   All schoolteachers do not rebuke their pupils because they are concerned about them.

NOTES ON "QUESTIONS & EXERCISES"

1. (Possible examples:)
   Every boy is interested in a girl.
   I didn't see only Ram.
   I don't want all of you to leave.
   Everyone didn't like the concert at all.
   Two teachers taught five students last year. (... Five each, or five altogether)

2. Hint: The sentence (a) has an empty category PRO, which is a kind of variable bound by the quantifier *Every American*, while the sentence (b) actually has two quantifiers, each taking its own scope.

3. On one view, this sentence is four-ways ambiguous, because of scope interaction among the quantifier expression *all schoolteachers*, the negative element *not*, and the adverbial clause *because they are concerned about them*.